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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/848,153	05/03/2001	Stephen McConnell Gates	YOR920000640US1(13908)	7436

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09/03/2003

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3
EXAMINER

ROBERTSON, JEFFREY

ART UNIT

PAPER NUMBER

1712

DATE MAILED: 09/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/848,153

Applicant(s)

GATES ET AL.

Examiner

Jeffrey B. Robertson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-66 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-6, 16, 20-23 and 49-66 is/are allowed.
- 6) ☒ Claim(s) 15, 17-19 and 40-42 is/are rejected.
- 7) ☒ Claim(s) 7-15 and 24-48 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claims 7-15 and 30-38 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. For claims 7, 10, 13, 30, 33, and 36, defining the distances V_{cc} , V_{ee} , and AB without more does not further limit the parent claims 1 and 24. The examiner suggests writing claim 7 into claim 8, claim 10 into claim 11, claim 13 into claim 14, claim 30 into claim 31, claim 33 into claim 34, and claim 36 into claim 37 to remedy the situation.
2. Claims 24-48 are objected to because of the following informalities: For claim 24, the phrase "An interconnect structures" does not agree in number. The examiner suggests deleting the "s" at the end of the word "structures". Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
4. Claim 15 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for AB distances of 1-10 nm, does not reasonably provide enablement for AB distances of 2-50 nm. The specification does not enable

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any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

For claim 15, on page 8, lines 27-29, applicant sets forth that the distance for AB are 1-10 nm, and more preferably 2-5 nm. The specification does not support distances of AB of 11-50 nm.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 17-19 and 40-42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

For claims 17-19 and 40-42, there is a lack of antecedent basis for the term "said low-k dielectric binder". Applicant does not define a binder in claims 1 or 24.

Allowable Subject Matter

7. Claims 1-6, 16, 20-23 and 49-66 are allowed.

8. Claims 17-19 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

9. Claims 7-14, 24-39, and 43-48 would be allowable if rewritten or amended to overcome the claim objections set forth in this Office action.

10. Claims 40-42 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph and the claim objections set forth in this Office action.

11. Claim 15 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, first paragraph and the claim objections set forth in this Office action.

12. The following is a statement of reasons for the indication of allowable subject matter: The closest prior art is Gaynor (U.S. Patent No. 6,329,062), Gallagher et al. (U.S. Patent Application Publication No. 2003/0006477 A1), and Okura et al. (JP 10-284602, Machine Translation obtained from JPO web-site). Gaynor teaches a dielectric binder material that contains pores and silica particles. However, Gaynor does not teach or suggest particles or pores in the diameter ranges specified by applicant. Gaynor also does not teach or suggest that the particles and pores are uniformly spaced apart and arranged on three-dimensional periodic lattices. Figures 1A and 1B of Gaynor clearly show random orientations of particles and pores. Gallagher teaches porous dielectric materials where porogens of particle sizes within applicant's range are at least partially removed from the binder. However, Gallagher fails to teach or suggest that the pores and any of the porogen that would remain in the structure are uniformly spaced and are located on periodic lattice sites. Okura teaches voids, particles, and a binder material that make up an insulating layer of a semiconductor device. Okura fails to teach the size of the voids that are created or dielectric constants within the range claimed by applicant. For claims 49-66, none of these references teach or suggest the method as claimed by applicant.

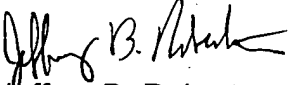
Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gnade et al. (U.S. Patent No. 5,561,318), Ayers (U.S. Patent No. 5,801,092), Leung et al. (U.S. Patent No. 6,171,687), Gates et al. (U.S. Patent No. 6,440,560), Asakawa et al. (U.S. Patent No. 6,565,763), and Gore et al. (U.S. Patent Application Publication 2003/0008989 A1) are cited for general interest.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey B. Robertson whose telephone number is (703) 306-5929. The examiner can normally be reached on Mon-Fri 7:00-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert A. Dawson can be reached on (703) 308-2340. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Jeffrey B. Robertson
Primary Examiner
Art Unit 1712

JBR